

Appendag for Retrofitting to an Office Chair for Conv rting Sam into a Comput r Workplace

Cross-Reference to a Related Application

This application is a continuation-in-part to application number
5 09/918,535 titled "Computer workstation kit" filed August 1, 2001.

Field of the Invention

The present invention is directed to providing a means for
allowing a computer operator sitting on a regular office chair to work
from his computer without requiring a free standing table or desk, but
10 at the same time not restricting him to using a laptop type computer on
his lap, which is not an ergonomic solution for extensive work.

Background of the Invention

More and more office workers, students and others are spending
increasing amounts of time working at computers and computer
15 terminals.

Personal computers in particular, and computer terminals in
general, can be divided into two generic types: "desktop" and
"laptop".

Desktop computers are generally provided with three
20 ergonomically designed interfaces for interaction with the operator: a
screen; a keyboard; and a cursor control means (mouse). Since space
and weight are not unduly limited, the screen may be large, the
keyboard may be large and ergonomically designed for operator
comfort, and the computer mouse is also designed to be comfortable
25 to use.

Indeed, there are a number of commercially available screens, keyboards, and mice having different properties, and the operator can choose, mix and match these interfaces for maximum comfort (within budgetary restrictions). Most importantly, as the screen, keyboard and
5 mouse are separate units, coupled together via the computer itself, by flexible wires only, and increasingly by cordless technologies, the relative positions of the individual interfaces and their positions with respect to the operator can be varied.

Ideally the screen should be at a comfortable angle and height for
10 viewing, and the keyboard should be at a convenient height for typing. The mouse is usually situated on a mouse pad somewhere to the right of the keyboard, although some operators, particularly left handed ones, prefer to locate the mouse to the left.

In contradistinction, laptop computers are characterized by
15 having the relative position of screen, keyboard and cursor control means rigidly fixed. For this reason, tracker balls and the like are generally used instead of a mouse for controlling the cursor. Laptops have many advantages. They are light, compact and portable. However, laptops are less convenient to use, and the operator is likely
20 to suffer cramps, pains, and eyestrain when using such devices over long periods of time.

To get away from the limitations of the desktop, various alternatives have been proposed.

US Patent 6,315,358 to Baru, whose disclosure is incorporated
25 herein by reference, describes an earlier invention of the present applicant, being a computer work station including a user seat and a monitor supporting tray positioned in front of the seat. The work station comprises a first chassis unit having a first base, an elongated

seat supporting member, a first varying mechanism for varying the location of the seat along the seat supporting member between a relatively reclining position and a relatively upright position. In addition the work station further comprises a second chassis unit
5 having a second base, an elongated monitor supporting member, a second varying mechanism for varying the location of the monitor supporting tray between an uppermost position and a lowermost position. A coupling mechanism couples the seat to the monitor supporting tray so that displacement of the seat toward a relatively
10 reclining position results in the displacement of the monitor supporting tray toward the uppermost position and displacement of the seat toward a relatively upright position results in the displacement of the monitor supporting tray toward the lowermost position.

US Patent 5,275,482 to Grant, whose disclosure is incorporated
15 herein by reference, describes an apparatus wherein a "U" shaped support base including spaced parallel legs mounts a chair member therebetween, wherein the chair member is oriented at an acute angle between the base legs and includes an adjustable lumbar assembly to effect adjustable lumbar support during use of the chair. The terminal
20 apparatus includes a keyboard support shelf and a monitor support shelf which may be adjustably mounted relative to the base.

US Patent 5,779,305 to Hocking, whose disclosure is incorporated herein by reference, describes a work station which includes a chair and means to support pieces of equipment such as a
25 personal computer, a printer and the like. The station has at least two upright stanchions, which project upwardly in a substantially parallel manner from a base. Sleeves are engaged on the stanchions and the sleeves can act as spacers. Support members for the pieces of

equipment are attached individually or in combination to a sleeve or sleeves so the support members will extend from the sleeves in a direction substantially normal to the longitudinal axis of the stanchions. The chair is supported between the stanchions at the
5 desired height by being attached to the sleeves which are engaged on the stanchions. The work station can also include an electrical power reticulation system, a sound system and a lighting arrangement.

US Patent 6,021,537 to Baus et al., whose disclosure is incorporated herein by reference, describes a computer workstation
10 which allows operation of a computer device from an ergonomically superior, recumbent position. Provision is made for supporting the computer device and the body parts of the operator at elevations and inclinations which make the computer device the most comfortable and ergonomically superior to operate. The workstation includes body
15 support means for supporting the operator's legs, back, shoulders, arms, and head

US Patent 6,089,663 to Hill, whose disclosure is incorporated herein by reference, describes an accessory chair apparatus for use with video games, the apparatus comprising a concave base, a seat
20 portion, and a console. The base is shaped so as to facilitate a rocking motion in both a front to back and a side-to-side direction. However, body stabilizers may also be deployed, to prevent such rocking motion. The seat portion may include a back portion upon which a headrest may be adjustably mounted. The headrest may include at
25 least one audio speaker mounted therein to enhance the game playing experience. The console is adjustably mounted on the front end of the base so as to ensure comfortable seating for occupants of various sizes. Also, a controller-mounted frame may be placed on the console

so as to accept a game controller, such as, for example, a steering wheel. The apparatus may also include a variety of storage compartments such as a basket, a case, and recesses in the body and the case.

5 US Patent 6,145,926 to Lin, whose disclosure is incorporated herein by reference, describes a computer chair device having a main frame, a main body disposed in the main frame, a support rod disposed on the main frame, a table plate disposed on the support rod, two support posts disposed on the main frame, and two upper plates
10 disposed on the support posts.

US Patent 6,270,157 to Kapushinski, whose disclosure is incorporated herein by reference, describes a "floppy desk" designed to interface with a modern personal computer system, and being anthropometrically sized for the average of the 95th percentile of
15 males and females. The floppy desk consists of an upper assembly and a support base. The upper assembly is composed of a tubular frame, a seat, an adjustable back and head rest, a foot platform, a computer support and a single plane work surface for monitor, keyboard and mouse.

20 US Patent 5,697,668 to Chao, whose disclosure is incorporated herein by reference, describes an adjustably coupled desk chair used e.g. in classrooms - having front and rear 'thimbles' which can slide on the upper sections of the tabletop and the seat supports respectively, to change the heights of the tabletop and the seat and the
25 space between them.

German Patent DE 4105372 to Desanta, whose disclosure is incorporated herein by reference, describes an EDP work station with

integral table and chair—adjustable together in coordinated movement by a coupling frame.

Swiss Patent CH 689578 to Huser, whose disclosure is incorporated herein by reference, describes a desk unit used for electronic data processing in home and office, having a fully-adjustable chair fixed to frame supporting considerable number of surfaces at varied orientation and inclination surrounding user ergonomically with computer, ancillaries and media.

PCT Publication No. WO 99922624 to Zephinie, whose disclosure is incorporated herein by reference, describes an ergonomic seat and support assembly for a computer operator.

A disadvantage of all the devices described in the abovementioned publications is that although they offer an alternative to the regular chair-table combination, in addition to dispensing with the table, they provide a built in seat, which unfortunately limits the user to a particular chair. It will be appreciated that a wide range of office type and executive chairs are available, of different shapes and sizes, offering different ergonomic properties and having different qualities of upholstery.

Embodiments of the present invention dispense with the table or desktop and provide an ergonomic solution for positioning the computer interfaces with respect to the operator, but additionally maintain a high degree of flexibility in design, shape, size and upholstery options for the seat.

Summary of the Invention

The present invention is directed to providing an appendage that is retrofittable to an office chair for converting the office chair into a computer workplace;

- 5 the office chair being characterized by comprising a seat supported by a central column, having a feet assembly attached thereto; wherein the appendage comprises: a chassis coupled to a seat connector, and a monitor supporting structure; the seat connector for facilitating connection of the chassis to the
- 10 central column of the office chair, and the monitor support structure for supporting a computer monitor thereon.

Typically, the monitor support structure comprises a monitor support tray.

- 15 Typically, the chassis includes at least one elongated supporting rail having an arcuate form. Preferably, the chassis comprises a pair of tubular guide rails separated from each other by a fixed distance along their length.

- Typically, the appendage includes varying means for varying the
- 20 position and angle of the monitor support structure with respect to the chair. In some embodiments, the varying means comprises an attachment for attaching the monitor support structure to the chassis, the attachment being attachable to the chassis in a range of positions along length of the chassis, allowing variation in the position of a
- 25 computer monitor on the monitor support structure with respect to the eyes of a user sitting on the chair.

The varying means may include a compression drive for supporting and holding the monitor support structure. Such a drive may be situated between a bracket affixed to the chassis below the monitor support structure and the bottom surface of the monitor support structure.

The varying means may comprise two pairs of auxiliary rollers affixed to the monitor support structure, enabling the monitor support structure to slide freely with respect to the chassis.

Optionally or alternatively, the varying means may comprise the seat connector being attachable to the chassis in a range of positions along length thereof.

Preferably the seat connector allows variation in viewing angle and distance of monitor on monitor support structure from eyes of a user sitting on said office chair.

Optionally and preferably, attached to said chassis there is provided at least one foot pedal for application of a force on said chassis for moving it from a first position to a second position with respect to said office chair. Most preferably, the appendage further comprises a helical spring configured as a contra to the force applicable via the pedal(s), for returning the chassis from said second position to the first position when the force is no longer applied to the at least one foot pedal.

The appendage preferably additionally comprises a first lock for locking the position of the chassis with respect to the office chair, and more preferably a second lock for locking the position of the monitor support structure with respect to the chassis.

Brief Description of Drawings

The present invention will be further understood and appreciated from the following detailed description taken in conjunction with the drawings in which:

- 5 Fig. 1A is an isometric projection of a first prior art office chair;
 Fig 1B is an isometric projection of a second prior art office chair;
- Fig. 2 is an isometric projection of a first embodiment of the present invention;
- 10 Fig. 3 is a side view of the embodiment of Fig. 2;
 Fig. 4 is a front elevation view of the embodiment of Fig. 3; and
 Fig. 5 is a view from above of the embodiment of Fig. 3.

Detailed Description of Embodiments

With reference to Fig. 1A there is shown, in isometric projection, an office chair 1 of the prior art having a seat 2 connected to a feet assembly 3 via a central pillar 4. Feet assembly 3 is designed to provide stability to office chair 1, and as shown, includes a plurality of radially protruding feet 5A-E, each of which has a caster 6A-E thereon, to allow the chair to be easily moved along the floor, in all directions. Central pillar 4 often includes a piston (not shown) allowing vertical height adjustment, and providing a pneumatic cushion which makes the office chair more comfortable. Furthermore, the seat is often able to rotate around central pillar 4, allowing a person seated in office chair 1 to swivel himself without moving feet 5A-E with respect to the floor. Sometimes, in addition to allowing a swiveling rotational movement, and a vertical height displacement, office chair 1 additionally has a tilt mechanism, allowing the seat to be tilted with respect to the central pillar and the feet assembly.

Office chair 1 includes a backrest 7, but does not include armrests and is fairly compact. The office chair of the type shown in Fig. 1A is commonly used by secretaries and typists, and is sometimes referred to as a "typist's chair". Typist chairs are usually padded to some extent, with cheap upholstery, and are usually somewhat limited in the positioning features available.

With reference to Fig. 1B there is shown, in isometric projection, a second office chair 1' of the prior art consisting of a seat 2' and back 7', feet assembly 3' including a plurality of radially protruding feet 5A-E and casters 6A-E connected to the seat 2' via a central pillar 4', as with the first office chair *mutatis mutandis*. Office chair 1' is fairly massive as compared to office chair 1, and is sometimes referred

to as an "executive chair". The executive type of office chair 1' may include further features such as armrests 8L, 8R, for example. Executive type office chairs 1' are usually well padded and upholstered in leather. Sometimes, they include vibration and massage systems. Generally, executive type office chair 1' is designed to allow an executive to sit comfortably at his / her desk for extensive periods. In the descriptions hereinbelow, reference to office chair 1 and to any of its components is meant to include office chair 1' and its components, as well as any office chair with similar components.

Office chair 1 is widely used by users operating a computer. Although laptop type computers can briefly be operated when positioned on the user's knees, for longer term operation, and when using a desktop type computer / computer terminal, the user is required to sit at a table or desk.

The tabletop of a conventional table is typically 90 cm above floor level. Although computer desks sometimes have keyboard trays about 85 cm above floor level, tables are fairly limited in that they rigidly define the height of the keyboard and screen. Also, tables and desks typically occupy a lot of floorspace.

Referring to Figures 2, 3, 4, and 5 there is shown in isometric projection, side view, front elevation, and from above, respectively, an embodiment of the present invention comprising an appendage for retrofitting office chair 1 around central column below seats 2 and above feet assembly 3 thereof.

Appendage 100 essentially consists of a monitor support structure 10 a seat connector 12 and a chassis 14. Seat connector 12 connects to any standard type office chair 1 as known in the art, around central column 4 thereof.

The chassis 14 consists of at least one tubular, elongated support rail 44, bent into an arcuate form, and preferably of a pair of such rails 44, 48 arranged as parallel, two rails 44, 48 being held at a constant separation by the monitor support structure 10 and by seat connector 12 attached thereto. Typically, at least one further spacer element 22 is also provided.

Seat connector 12 consists of a bracket 20 having a hole therethrough 36 through which central column 4 passes. There is preferably provided a locking means 40 for locking bracket 20 onto the central column. Rails 44, 48 pass through corresponding holes 28, 26 in bracket 20, allowing rails 44, 48 to be attached to bracket 12, and thus to central column 4 of the office chair (not shown in its entirety) thereby.

Monitor support structure 10 may consist of a monitor support tray 54 having holes thereon 56, 58 through which ends of rails 44, 48 pass. Attached to tray 54 are pairs of grooved auxiliary rollers 60, 70 which engage rail 48, above and below tray 54 respectively, and corresponding rollers 62, 72 which engage rail 44, above and below tray 54 respectively. Rollers 62, 72, 60, 70 engage rails 44, 48 and allow the positioning of monitor tray 54 with respect to bracket 20, and thus positioning of a monitor thereon (not shown) with respect to the user seated in the office chair. For accurate positioning of tray 54 with respect to the user (not shown), monitor support structure 10 includes a rail clamp 50 and piston device 64.

It will be appreciated however, that other means for varying the position and / or angle of tray 54 with respect to chassis 14, and thus the monitor position with respect to the user may be substituted, as alternative embodiments of the present invention.

As shown, attached to rails 44, 48 of the chassis 14, are foot pedals 30, 32, and around rails 44, 48, behind the bracket 20 are a pair of helical springs 34, 38 held in position by retaining elements 66, 68, respectively. The user, sitting on seat 2 may rest his feet on pedals 32, 34 and exert a force thereon, thereby causing chassis 14 to move forwards in bracket 20, increasing separation of a monitor on tray 54 from the user. When the force is relieved, compressed helical springs 34, 38 will tend to return chassis 14 to its original position.

Strictly speaking, of course, only one foot pedal is required, however providing a pair of foot pedals 30, 32 makes the appendage of the embodiment of the present invention comfortably used by enabling the user to use either his right or left foot.

Having described embodiments, many variations will now present themselves to those skilled in the art, all of which providing the essential feature of the invention, that is, an appendage that is retrofittable to an office chair, that converts the chair into a computer workplace, allowing a user to work at a computer without requiring a laptop type computer or a desktop type computer and a desk.

Other trays for keyboard and mouse may be attached to chassis 14, or all interfaces between operator and computer may be operated on monitor support tray 54.

It will be appreciated that the invention is not limited to what has been described hereinabove merely by way of example. Rather, the invention is limited solely by the claims which follow, wherein the word 'comprise', and variations thereof, such as 'comprising', 'comprised' and the like, indicate that the listed component or steps are included, but not necessary to the exclusion of other components or steps not specifically listed.